Assessing Patient Safety Culture of Internal Medicine House Staff in an Academic Teaching Hospital

Harish Jasti, MD, MS
Heena Sheth, MD
Margaret Verrico, RPh, BS Pharm
Subashan Perera, PhD
Gregory Bump, MD
Deborah Simak, RN, MNEd
Raquel Buranosky, MD, MPH
Steven M. Handler, MD, MS

Abstract

Purpose Patient safety culture (PSC) examines how individuals perceive an organization's commitment and proficiency in health and safety management. The primary objective of this study was to assess hospital PSC from the perspective of internal medicine house staff, and to compare the results by postgraduate year (PGY) of training and to national hospital benchmark data.

Methods The authors modified and used a version of the Hospital Survey on Patient Safety Culture (HSOPSC), which has 12 PSC dimensions. Each dimension uses a 5-level Likert scale of agreement ("Strongly disagree" to "Strongly agree") or frequency ("Never" to "Always"). The survey was distributed to 68 PGY-2 and PGY-3 internal medicine house staff at an academic medical center between December 2006 and February 2007. Composite scores were created for each respondent by calculating the proportion of positive responses for each domain. Domain score means were compared between PGYs and to survey data from hospitals that administered the HSOPSC (ie, benchmark data).

Results The overall response rate was 85.3% (58/68). House staff scored lower on 6 and 4 of the 12 PSC dimensions, when compared with the overall national hospital and medicine unit benchmarks, respectively ($P < .05$). PGY-3 staff scored lower than PGY-2 staff in 2 dimensions ($P < .05$).

Conclusions PGY-2 and PGY-3 internal medicine house staff at our institution were in agreement on most of the PSC dimensions. Overall, house staff PSC was significantly lower than national hospital benchmark data for half of the dimensions. The results of this study will be used to establish internal PSC benchmarks and to identify targets for interventions to further improve PSC.

All authors are at the University of Pittsburgh: **Harish Jasti, MD, MS, Gregory Bump, MD, Deborah Simak, RN, MNEd,** and **Raquel Buranosky, MD, MPH,** are with the Division of General Internal Medicine, Department of Medicine, School of Medicine; **Heena Sheth, MD,** is with the Department of Medicine, School of Medicine; **Margaret Verrico, RPh, BS Pharm,** is with the Department of Pharmacy and Therapeutics, School of Pharmacy; **Subashan Perera, PhD,** is with the Division of Geriatric Medicine, Department of Medicine, School of Medicine, and the Department of Biostatistics; and **Steven M. Handler, MD, MS,** is with the Division of Geriatric Medicine, Department of Medicine, and the Department of Biomedical Informatics, School of Medicine.

Dr Handler was supported in part by National Institutes of Health grants 5KL2RR024154-03 (Clinical and Translational Science Awards Multidisciplinary Clinical Research Career Development Award) and a Merck/American Federation for Aging Research Junior Investigator Award in Geriatric Clinical Pharmacology.

The authors wish to especially thank those members of the Educational Innovation Project who contributed to the development and submission of the Patient Safety section, including Frank Kroboth, Tami Merryman, Richard Simmons, Francis Solano, Adele Towers, and Wishwa Kapoor.

Corresponding author: Harish Jasti, MD, MS, Department of Medicine, Division of General Internal Medicine, University of Pittsburgh, 200 Lothrop Street, MUH 9E25, Pittsburgh, PA 15213, 412.692.4847, jastih@upmc.edu

Editor's Note: The online version of this article includes additional materials such as data tables, survey or interview forms or assessment tools.

DOI: 10.4300/01.01.0023

Introduction

The Institute of Medicine (IOM) suggests that the biggest challenge to moving toward a safer health care system is changing the patient safety culture (PSC) from one in which people are blamed for errors to one in which errors are treated as opportunities to improve the system and prevent harm.[1] Patient safety culture examines how the perceptions, behaviors, and competencies of individuals and groups determine an organization's commitment, style, and proficiency in health and safety management.[2] PSC assessments have been used by organizations to determine targets for interventions to improve patient safety, evaluate the success of patient safety interventions, fulfill regulatory requirements, and conduct benchmarking.[3,4] Hospitals with well-developed PSC have been shown to reduce lengths of stay, reduce medication reconciliation errors, and improve nursing staff retention.[5]

The IOM also recommends that health care organizations assess their PSC, redesign systems to reduce opportunities for error, and establish comprehensive patient safety programs to increase detection of adverse events.[6,7] Toward this end, our internal medicine residency program

submitted a successful application in 2006 to the Accreditation Council for Graduate Medical Education (ACGME) to become an Educational Innovation Project (EIP)-recognized training program.[8] The overall goal of the EIP project is to facilitate competency-based education and outcomes assessment in those internal medicine programs that are well suited and ready for innovation. The reporting of house staff PSC fulfills the EIP requirement for assessing and reporting outcomes. More recently, the ACGME Program Requirements for Resident Education in Internal Medicine, state that *all* programs demonstrate that there is a culture of patient safety and continuous quality improvement.[9]

The purpose of this article is to describe the initial set of steps taken by our internal medicine residency program to assess patient safety in the context of our EIP proposal. We assessed hospital PSC from the perspective of internal medicine house staff using a standardized and previously validated instrument in order to raise awareness of patient safety issues, identify targets for interventions to improve patient safety, fulfill the EIP requirement for assessing and reporting outcomes, and establish our own program-specific benchmark data. The primary objective of this study was to assess PSC in internal medicine house staff at our institution, and to compare the results across postgraduate years (PGYs) of training and to national hospital benchmark data. The secondary objective was to determine a list of key patient safety topics to be included in a patient safety curriculum.

TABLE 1 **Patient Safety Dimensions and Outcome Measures**

Patient safety culture dimensions
Communication openness
Feedback and communication about error
Frequency of events reported
Handoffs and transitions
Management support for patient safety
Nonpunitive response to error
Organizational learning and continuous improvement
Overall perceptions of safety
Staffing
Supervisor/manager expectations and actions promoting patient safety
Teamwork across units
Teamwork within units
Patient safety outcomes
Number of events reported
Overall patient safety grade

Methods

Original Survey Instrument and Benchmark Data

We used the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture (HSOPSC), a validated instrument that has 12 safety culture dimensions and 2 outcome measures (TABLE 1). This survey is primarily useful for assessing the safety culture of a hospital as a whole, or for specific units within hospitals, and not for assessing individual patient safety perceptions or skills. The 12 safety culture dimensions measure the perception of the respondent with respect to the safety of patients in their patient care unit (9 dimensions) and also their overall view of the safety of patients in the hospital in its entirety (3 dimensions). Each dimension has 3 to 5 questions and uses a 5-point Likert scale of agreement (''Strongly disagree'' to ''Strongly agree'') or frequency (''Never'' to ''Always'').

The outcome measures use single-item responses about the number of events reported (defined as errors of any type, regardless of whether they result in patient harm) and the overall patient safety grade (''Excellent'' to ''Failing''). Previous and current analyses have shown that all 12 dimensions had acceptable levels of internal consistency (Cronbach's alpha = .63 to .84 and .31 to .83).[10]

The AHRQ established the HSOPSC Comparative Database as a central repository for survey data from hospitals that have administered the AHRQ patient safety culture survey instrument. The database serves as a resource for organizations wishing to compare their patient safety culture survey results with those of other hospitals. To create publicly accessible benchmark data, the survey was administered to 108 621 hospital employees from 382 hospitals containing 8 279 internal medicine units across the United States between October 2004 and July 2006.[11]

Modified Survey Instrument

The HSOPSC was pilot tested for use by 4 internal medicine chief residents. Based on their suggestions, the following changes were made to create the House Staff Patient Safety Culture (H-PSC) survey: (1) an additional definition for ''event reporting'' was added to orient participants; (2) the following phrases were modified–''staff'' was replaced with ''house staff,'' ''hospital work area'' or ''unit'' was replaced with ''hospital,'' and ''agency/temporary staff'' was clarified to mean moonlighters or cross-covering house staff; and (3) the demographics section was expanded to include information about gender, age, medical school training, and future career plans. No other changes were made to the HSOPSC. The H-PSC uses the same question format, question order, and response options as the HSOPSC (see Appendix online).

An additional section of the survey was added listing 11 potential patient safety topics to be included in the future

Appendix

Housestaff Survey on Patient Safety Culture (H-PSC)

INSTRUCTIONS: This survey asks your opinion about patient safety issues, medical error, and event reporting ONLY at your teaching hospital and will take about 15 minutes to complete. Please answer all the questions as best as you can from your own perspective. The following are the definitions that will be used for the purpose of completing this survey:

- ***"Patient safety"*** *is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.*
- *An* ***"event"*** *is defined as any type of error (including medication errors), mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm (i.e., adverse event).*
- ***"Event reporting"*** *is defined as any formal written, electronic, or verbal account of an event communicated to the appropriate personnel.*

SECTION A: Your Work Area

Please indicate your agreement or disagreement with the following statements about your teaching hospital. For each item, please check the single most appropriate box.

Thinking ONLY about your teaching hospital…	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. People support one another in these hospitals	☐1	☐2	☐3	☐4	☐5
2. We have enough housestaff to handle the workload	☐1	☐2	☐3	☐4	☐5
3. When a lot of work needs to be done quickly, we work together as a team to get the work done	☐1	☐2	☐3	☐4	☐5
4. In these hospitals, people treat each other with respect	☐1	☐2	☐3	☐4	☐5
5. Housestaff in these hospitals work longer hours than is best for patient care	☐1	☐2	☐3	☐4	☐5
6. We are actively doing things to improve patient safety	☐1	☐2	☐3	☐4	☐5
7. We use more "temporary" housestaff (e.g. moonlighters or residents on jeopardy) than is best for patient care	☐1	☐2	☐3	☐4	☐5
8. Housestaff feel like their mistakes are held against them	☐1	☐2	☐3	☐4	☐5
9. Mistakes have led to positive changes here	☐1	☐2	☐3	☐4	☐5
10. It is just by chance that more serious mistakes don't happen around here	☐1	☐2	☐3	☐4	☐5
11. When one area in these hospitals gets really busy, others help out	☐1	☐2	☐3	☐4	☐5
12. When an event is reported, it feels like the person is being written up, not the problem	☐1	☐2	☐3	☐4	☐5

SECTION A: Your Work Area (continued)

Thinking ONLY about your teaching hospital…	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
13. After we make changes to improve patient safety, we evaluate their effectiveness	☐1	☐2	☐3	☐4	☐5
14. We work in "crisis mode" trying to do too much, too quickly	☐1	☐2	☐3	☐4	☐5
15. Patient safety is never sacrificed to get more work done	☐1	☐2	☐3	☐4	☐5
16. Housestaff worry that mistakes they make will be kept in their personnel file	☐1	☐2	☐3	☐4	☐5
17. Housestaff worry that mistakes they make will affect their future careers	☐1	☐2	☐3	☐4	☐5
18. We have patient safety problems in these hospitals	☐1	☐2	☐3	☐4	☐5
19. Our procedures and systems are good at preventing errors from happening	☐1	☐2	☐3	☐4	☐5

SECTION B: Your Supervisor/Manager (e.g., chief residents, attendings, program director)

Please indicate your agreement or disagreement with the following statements about your immediate supervisor/manager or person to whom you directly report. For each item, please check the single most appropriate box.

Thinking ONLY about your teaching hospital…	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	☐1	☐2	☐3	☐4	☐5
2. My supervisor/manager seriously considers housestaff suggestions for improving patient safety	☐1	☐2	☐3	☐4	☐5
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	☐1	☐2	☐3	☐4	☐5
4. My supervisor/manager overlooks patient safety problems that happen over and over	☐1	☐2	☐3	☐4	☐5

SECTION C: Communications

How often do the following things happen at your teaching hospital? For each item, please check the single most appropriate box.

Thinking ONLY about your teaching hospital…	Never	Rarely	Some-times	Most of the time	Always
1. We are given feedback about changes put into place based on event reports	☐1	☐2	☐3	☐4	☐5
2. Housestaff will freely speak up if they see something that may negatively affect patient care	☐1	☐2	☐3	☐4	☐5
3. We are informed about errors that happen in these hospitals	☐1	☐2	☐3	☐4	☐5

4. Housestaff feel free to question the decisions or actions of those with more authority	☐1	☐2	☐3	☐4	☐5
5. In these hospitals, we discuss ways to prevent errors from happening again	☐1	☐2	☐3	☐4	☐5
6. Housestaff are afraid to ask questions when something does not seem right	☐1	☐2	☐3	☐4	☐5

SECTION D: Frequency of Events Reported

In your hospital work area/unit, when the following mistakes happen, *how often are they reported?*
For each item, please check the single most appropriate box.

Thinking ONLY about your teaching hospital…	**Never** ▼	**Rarely** ▼	**Some-times** ▼	**Most of the time** ▼	**Always** ▼
1. When a mistake is made, but is *caught and corrected before affecting the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
2. When a mistake is made, but has *no potential to harm the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
3. When a mistake is made that *could harm the patient*, but does not, how often is this reported?	☐1	☐2	☐3	☐4	☐5
4. When a mistake is made that *causes patient harm*, how often is this reported?	☐1	☐2	☐3	☐4	☐5

SECTION E: Patient Safety Grade

Please give your teaching hospital an overall grade on patient safety. Mark your answer by checking single most appropriate box.

A Excellent ▼	**B** Very Good ▼	**C** Acceptable ▼	**D** Poor ▼	**E** Failing ▼
☐	☐	☐	☐	☐

SECTION F: Your Hospital

Please indicate your agreement or disagreement with the following statements about your hospitals.
Mark your answer by checking single most appropriate box.

Thinking ONLY about your teaching hospital…	**Strongly Disagree** ▼	**Disagree** ▼	**Neither** ▼	**Agree** ▼	**Strongly Agree** ▼
1. Hospital management provides a work climate that promotes patient safety	☐1	☐2	☐3	☐4	☐5
2. Hospital units do not coordinate well with each other	☐1	☐2	☐3	☐4	☐5
3. Things "fall between the cracks" when transferring patients from one unit to another	☐1	☐2	☐3	☐4	☐5
4. There is good cooperation among hospital units that need to work together	☐1	☐2	☐3	☐4	☐5
5. Important patient care information is often lost during shift changes	☐1	☐2	☐3	☐4	☐5
6. It is often unpleasant to work with housestaff from other hospital units	☐1	☐2	☐3	☐4	☐5

7. Problems often occur in the exchange of information across hospital units	☐1	☐2	☐3	☐4	☐5
8. The actions of hospital management show that patient safety is a top priority	☐1	☐2	☐3	☐4	☐5
9. Hospital management seems interested in patient safety only after an adverse event happens	☐1	☐2	☐3	☐4	☐5
10. Hospital units work well together to provide the best care for patients	☐1	☐2	☐3	☐4	☐5
11. Shift changes are problematic for patients in this hospital	☐1	☐2	☐3	☐4	☐5

SECTION G: Number of Events Reported

1. **In the past 12 months, how many event reports (*of any kind*) have you filled out and submitted? Mark your answer by checking the single most appropriate box.**

None	1 to 2	3 to 5	6 to 10	11 to 20	21 or more
▼	▼	▼	▼	▼	▼
☐A	☐B	☐C	☐D	☐E	☐F

Section H: Patient Safety Needs Assessment

We are designing a patient safety curriculum to ensure all housestaff learn basic safety topics. Please select FIVE topics from the list below that you feel would be important to include in the curriculum:

☐a	Adverse drug events (defined as an injury related to the use of a drug): recognition, reporting, and prevention.
☐b	Adverse events related to transitions in care (e.g. cross-coverage, patient transfers, etc.): recognition and prevention.
☐c	Anticoagulation management: guideline application and prevention of complications.
☐d	Delirium: prevention, recognition, and management.
☐e	Hyper/hypoglycemia: prevention, recognition, and management
☐f	Medical errors: disclosing information to patients and family members.
☐g	Hospital-acquired infections (e.g., central line and urinary catheter associated): prevention, recognition, and management.
☐h	Hospital-acquired complications (e.g., falls, restraints and related injuries, pressure ulcers): prevention, recognition, and management.
☐i	Promoting a culture of safety.
☐j	Contrast-induced nephropathy: prevention, recognition, and management.
☐k	Venous thromboembolism prevention: guideline application and prevention of complications.

SECTION I: Background Information

This information will help in the analysis of the survey results.

1. What is your level of post-graduate training?

☐ a. PGY-1 ☐ c. PGY-3 ☐ e. Fellow, please specify:

☐ b. PGY-2 ☐ d. Chief resident _____

2. What is your current age?

☐ a. 21-25 ☐ c. 31-35

☐ b. 26-30 ☐ d. Greater than 35

3. What is your gender?

☐ a. Male ☐ b. Female

4. Are you a graduate of a U.S. medical school?

☐ a. Yes ☐ b. No

5. What are your future career plans?

☐ a. Private/group practice ☐ c. Academic position

☐ b. Fellowship, please specify specialty: ☐ d. Other. Please specify:

_____ _____

6. Have you ever been aware of a patient safety event?

☐ a. Yes ☐ b. No

7. Have you participated in an educational activity on patient safety?

☐ a. Yes ☐ b. No

If "Yes", please check all those that apply:

☐ a. Computer modules ☐ d. Morning report discussion

☐ b. Noon conference ☐ e. Grand rounds

☐ c. Workshop ☐ f. Other:

_____

THANK YOU FOR COMPLETING THIS SURVEY!!

TABLE 2 **Characteristics of Respondents, Stratified By Postgraduate Year (PGY)**

Characteristic	PGY-2 N = 30	PGY-3 N = 28	Total N = 58
Number of potential respondents	35	33	68
Response rate (%)	85.7	84.8	85.3
Graduate of US medical school, N (%)	23 (76.7)	20 (71.4)	43 (74.1)
Age group (y)			
21–25	2 (6.7)	0 (0.0)	2 (3.4))
26–30	20 (66.7)	20 (71.4)	40 (69.0)
30–35	8 (26.7)	6 (21.4)	14 (24.1)
36+	0 (0.0)	2 (7.1)	2 (3.4)
Fellowship intent (%)	21 (77.8)	18 (66.7)	39 (72.2)
Gender (% female)	18 (60.0)	11 (40.0)	29 (50.0)

development of a patient safety curriculum. The topics for this section were based primarily on a list of patient safety practices published by the AHRQ.[12] Additional topics were included based on prior work or expertise of the study coauthors.[13,14] In order to prioritize the development of the initial safety curriculum, each respondent was asked to select 5 safety topics.

Study Participants and Setting

After receiving approval from the institutional review board, the survey was distributed to a convenience sample comprising all (N = 68) PGY-2 and PGY-3 internal medicine house staff at the University of Pittsburgh Medical Center Presbyterian Hospital training program between December 2006 and February 2007. The PGY-1 house staff were excluded from the study because they had been at the training program for as little as 6 months, and the literature suggests that it may take at least 1 year to appreciate and assess institutional PSC.[15] Each survey packet contained a cover letter, a copy of the survey, and a ballot to enter into a drawing for one of two $100 gift certificates. A second packet was placed in the mailboxes of nonrespondents if the survey was not received within 4 weeks.

Data Analysis

Guidelines for computing patient safety dimensions for the HSOPSC have already been published, and we used the same scoring methods so that the results of this study could be compared with their benchmark data.[10,16] The scoring consists of several steps. First, to calculate response rates, the number of respondents per PGY was divided by the total number of potential respondents per PGY. Next, individual responses to each survey question were classified as a "positive" response if the actual response was "Agree/Strongly agree" or "Most of the time/Always" in positively worded questions, and "Disagree/Strongly disagree" or "Rarely/Never" in negatively worded questions. For each respondent, domain scores were computed by taking the number of positive responses for each domain, dividing it by the number of questions in the same domain, and multiplying by 100. The PSC domain scores could range from 0 to 100, where lower scores represented worse (ie, less well-developed) PSC.

The 12 domain scores were summarized using appropriate descriptive statistics for all respondents and by level of training. We used one and two sample *t* tests to compare domain score means between PGYs and against the published national benchmarks. The safety curriculum topics were calculated using appropriate descriptive statistics. For all statistical analyses, we used SAS version 9 for Windows (SAS Institute Inc, Cary, NC).

Results

The overall response rate was 85.3% (58 of 68), with PGY-2 and PGY-3 response rates of 85.7% and 84.8%, respectively. Most respondents (70%) were between 26 and 30 years of age and had graduated from a US medical school (74.1%). Most of the house staff (72.2%) planned on entering into a fellowship program upon completion of their residency training. Additional demographic information is summarized in TABLE 2.

The mean PSC composite scores, reflecting the perceptions of the house staff about their hospital, are shown in TABLE 3. The PGY-3 staff scored lower than PGY-2 staff in 2 of the 12 PSC dimensions: supervisor expectations and actions promoting patient safety, and teamwork across units ($P < .05$).

TABLE 3 **Comparison of Mean Patient Safety Culture (PSC) Composite Scores Across Post-Graduate Year (PGY) of Training**

PSC Dimension	PGY-2 Composite Score[a]	PGY-3 Composite Score[a]	*P* Value
Communication openness	44	30	NS
Feedback and communication about error	31	22	NS
Frequency of events reported	34	33	NS
Handoffs and transitions	23	15	NS
Management support for patient safety	66	56	NS
Nonpunitive response to error	44	42	NS
Organizational learning and continuous improvement	71	62	NS
Overall perceptions of safety	52	57	NS
Staffing	55	49	NS
Supervisor/manager expectations and actions promoting patient safety	82	68	.03
Teamwork across units	65	46	.03
Teamwork within units	73	63	NS

Abbreviations: NS, nonsignificant *P* value.

[a] The composite score is the average of individual rates of agreement with items within dimensions as described in the Methods section.

The mean PSC composite scores of internal medicine house staff compared with all-hospital and internal medicine unit benchmarks are shown in TABLE 4. House staff had lower PSC in 6 dimensions when compared to the all-hospital benchmark data, namely communication openness, feedback and communication about error, frequency of events reported, handoffs and transitions, overall perceptions of safety, and teamwork within units ($P < .05$). House staff had lower PSC in 4 dimensions when compared with medicine unit benchmarks, namely communication openness, feedback and communication about error, frequency of events reported, and handoffs and transitions ($P < .05$).

Additionally, house staff reported fewer adverse events when compared with the national benchmark data. Sixty-four percent of house staff did not report an adverse event during the 12-month period prior to survey administration, as compared with 53% of the benchmark respondents. Overall, 70% of the house staff and benchmark respondents rated their institutional patient safety grade as excellent or very good. However, only 6% of the house staff rated the hospital as having an excellent patient safety grade, compared with 22% of the benchmark respondents.

The 3 safety topics most frequently selected by internal medicine house staff to structure their initial patient safety curriculum included (1) adverse drug events (79.3%), (2) adverse events related to transition of care (72.4%), and (3) disclosing medical errors to patients and family (55.2%) (TABLE 5).

Discussion

This study systematically assessed PSC in an internal medicine residency program and has 2 important findings. First, PGY-2 and PGY-3 internal medicine house staff were in general agreement in 10 of the 12 PSC dimensions measured in the survey. Second, in half of the PSC dimensions, the PSC composite scores for the house staff were significantly lower than national benchmark data.

The PGY-2 internal medicine house staff rated both the dimensions for supervisor expectations and actions promoting patient safety and teamwork across units significantly higher than their PGY-3 counterparts. These findings are not entirely surprising as the differences can be potentially attributed to the increased hospital ward experiences and changing roles and responsibilities as house staff progress in their training. For example, PGY-2 house staff usually have more direct supervision by attending physicians, compared with PGY-3 residents. The increased supervision provides additional opportunities for feedback about performance on patient management and safety issues.

Similarly, the difference in the teamwork across units dimension could be because in our institution PGY-3 staff have more experience with other rotations that require significantly more cooperation among hospital units for patient care. The PGY-3 staff may have a lower score in this dimension because of the challenges that they have faced in their interactions with other specialties in the hospital (eg, transferring a patient to or from the intensive care unit or to a

TABLE 4 **Comparison of Mean Patient Safety Culture (PSC) Composite Scores of Internal Medicine House Staff and Hospitals**

PSC Dimension	House Staff Composite Score[a] (N = 58)	All-Hospital Benchmarks (N = 108, 621)		Medicine Unit Benchmarks (N = 8, 279)	
		Score[b]	*P* Value	Score[b]	*P* Value
Communication openness	37	61	<.01	55	<.01
Feedback and communication about error	27	62	<.01	55	<.01
Frequency of events reported	33	59	<.01	59	<.01
Handoffs and transitions	19	45	<.01	47	<.01
Management support for patient safety	61	69	0.08	64	NS
Nonpunitive response to error	43	43	0.95	39	NS
Organizational learning and continuous improvement	67	69	0.58	67	NS
Overall perceptions of safety	54	63	0.03	53	NS
Staffing	52	55	0.46	52	NS
Supervisor/manager expectations and actions promoting patient safety	75	74	0.76	71	NS
Teamwork across units	56	57	0.82	55	NS
Teamwork within units	69	78	<.01	73	NS

Abbreviation: NS, nonsignificant *P* value.

[a] The composite score is the average of individual rates of agreement with items within dimensions as described in the Methods section.
[b] Hospital benchmarking data derived from Agency for Healthcare Research and Quality.

surgical floor). These challenges, combined during a greater than 2-year period, may have led to the perception that there was decreased cooperation among the different hospital units.

Difficulty with communication and teamwork was a common theme associated with the majority of PSC dimensions that were significantly lower in internal medicine house staff as compared with hospital benchmarks. In particular, our study suggests that house staff perceive that there are significant problems with handoffs and transitions of care both within and across units. Communication failures can compromise optimal patient care and are one of the most common root causes of medical error and adverse events.[17–19] For example, Singh et al[20] studied medical errors involving trainees and found that a major cause involved teamwork-related factors, the most prevalent ones being lack of supervision and handoffs. Moreover, many studies have demonstrated how a lack of clear communication during transitional care and sign-out are critical causes of error and adverse events.[21–26]

House staff play a pivotal role and have a responsibility to communicate information about both near-misses and adverse events.[27,28] However, it has been shown that trainee physicians are sometimes reluctant to communicate errors and adverse events. Barriers to incident reporting include the fear of blame and retribution (ie, the "culture of blame"), the uncertainty about reporting needs and mechanisms, concern about the time required, and lack of feedback once an incident is reported.[29–34] Therefore, it is critical to improve the climate of "speaking up" and break free from the "blame cycle" and promote a "reporting culture."[19,29,30]

House staff selected adverse drug events, adverse events related to transitions in care, and disclosing medical errors to patients as the topics to be included in a patient safety curriculum, likely because they commonly occur and are often associated with negative consequences. For example, a meta-analysis of fatal adverse drug events suggest that these events are between the fourth and sixth leading causes of death in the United States, are associated with prolonged lengths of stay, and excess health care expenditures.[35,36] Adverse events related to transitions in care may be a result of processes or factors at the level of the health system, patient, or clinician.[37,38] Finally, despite the frequency and potential impact, physicians are rarely provided with the skills necessary to disclose them appropriately and prevent medical errors.[39,40]

TABLE 5 **Patient Safety Topics Selected As Important By Internal Medicine House Staff**

Patient Safety Topics[a]	No. of House Staff Selecting Topic (%)
Adverse drug events (defined as an injury related to the use of a drug): recognition, reporting, and prevention.	46 (79.3)
Adverse events related to transitions in care (eg, cross-coverage, patient transfers): recognition and prevention.	42 (72.4)
Medical errors: disclosing information to patients and family members.	32 (55.2)
Hospital-acquired infections (eg, central line and urinary catheter associated): prevention, recognition, and management.	27 (46.6)
Anticoagulation management: guideline application and prevention of complications.	25 (43.1)
Delirium: prevention, recognition, and management.	25 (43.1)
Hospital-acquired complications (eg, falls, restraints and related injuries, pressure ulcers): prevention, recognition, and management.	25 (43.1)
Contrast-induced nephropathy: prevention, recognition, and management.	22 (37.9)
Hyper/hypoglycemia: prevention, recognition, and management.	22 (37.9)
Venous thromboembolism prevention: guideline application and prevention of complications.	19 (32.8)
Promoting a culture of safety.	13 (22.4)

[a] Derived from Shojania KG, Duncan BW, McDonald KM, Watchter RM. *Making Health Care Safer: A Critical Analysis of Patient Safety Practices.* Rockville, MD: Agency for Healthcare Research and Quality; 2001. Report No. 43. AHRQ publication 01-E058.

Strengths and Limitations

Our study has several strengths. First, it systematically assessed PSC in an internal medicine residency program. Second, the instrument used to measure house staff PSC is based on the same items and dimensions as the previously validated and reliable HSOPSC survey instrument developed by the AHRQ. In addition, minimal changes were made to the original survey, thereby preserving the instrument's psychometric properties. Last, the response rate to this survey was 85.3%, which is higher than most surveys that have assessed PSC in a variety of clinical settings that range from 18% to 71%.[41–43]

Our study has several potential limitations that should be acknowledged. The sample size is small and represents only a single institution. This may have limited the statistical power to detect significant differences across PGYs. There are also limitations inherent to conducting survey-based research. These limitations include response and nonresponse bias as well as recall bias. Overall, these factors may reduce the generalizability of our results to other institutions. Another limitation could have been the inclusion of a nonstandardized list of general (ie, not house staff-specific) patient safety topics previously published by the AHRQ. It is possible that having open-ended questions about which patient safety topics were most important may have provided more valid results.

Implications and Further Research

Our house staff training program and institution understand the complexities of the IOM reports on safety and quality, and have taken significant steps toward improving patient safety culture. Communication and transmission of these interventions to the frontline health care professionals are continuing to be refined and implemented. To improve PSC, we have developed a multifaceted patient safety curriculum, part of which has been successfully implemented in the house staff program. These interventions include grand rounds presentations; morbidity and mortality conferences incorporated into morning reports; patient safety noon conferences; academic detailing by faculty and resident champions; simulation-based education on procedures with real-time feedback; direct 24-hour supervision on performing procedures from designated specialists; multidisciplinary teams composed of house staff, faculty, pharmacists, nurses, and case managers who work together to enhance patient care and safety; and point-of-care reminders and computerized physician order entry with computerized decision support. We are aware that curricular changes and educational strategies may not improve all issues surrounding PSC but will require resources and systems beyond the residency program.

We believe that the H-PSC survey can help meet the new Residency Review Committee for Internal Medicine

standard that requires programs to demonstrate that there is a culture of patient safety. Additional studies are also needed to assess PSC in other types of residency training programs (eg, general surgery, pediatrics, family medicine, geriatric medicine) and clinical environments (eg, ambulatory care, home-based primary care, nursing home care) to develop benchmarking data and identify targets for interventions to improve PSC. In addition, research should also be conducted to further investigate potential differences in PSC between house staff and attending physicians.

Conclusion

The PGY-2 and PGY-3 internal medicine house staff at our institution were in agreement with each other on most of the PSC dimensions. Overall, house staff perceptions of hospital PSC was significantly lower than national hospital benchmark data for half of the dimensions. The results of this study will be used to establish internal PSC benchmarks to track temporal trends. It is anticipated that greater exposure to patient safety programs will improve PSC scores and promote the education of resident physicians invested in improving the safety and efficiency of patient care.

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